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Modeling the spectral energy distributions and multi-wavelength polarisation of blazars

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The radio through optical-UV/X-ray emission from blazars is dominated by highly polarised synchrotron emission from relativistic jet electrons. The total degree of polarisation is determined by the polarised non-thermal synchrotron emission and thermal unpolarised emission components from the dusty torus, host galaxy, emission lines from the broad line region (BLR) and accretion disk. The unpolarised accretion disk emission dilutes the synchrotron polarisation and reveals its presence through a decrease of the optical polarisation degree towards higher frequencies in spectropolarimetry observations. Considering a leptonic model, the high-energy X-ray and gamma-ray emission can be modelled as polarised synchrotron self-Compton radiation which is diluted by Compton up-scattering of unpolarised external radiation fields of the BLR and accretion disk. A target-of-opportunity, Large Science Program "Observing the Transient Universe"from the Southern African Large Telescope, provides spectropolarimetry data for flaring blazars. This program includes co-ordinated multi-wavelength observations from the Las Cumbres Observatory, the Swift-XRT and the Fermi-LAT. We present a spectral energy distribution and polarisation model fit applied to the optical-UV regime of the flat spectrum radio quasar 4C+01.02 (z = 2.1), constraining its black hole mass to 4 × 108 Msol, and further X-ray through gamma-ray studies from the fit results.

Abstract field

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